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REMARKS

AS TO THE RESTRICTION

Applicants confirm their election without traverse of Group I (claims 1-15), that was made earlier by telephone call with the Examiner. Claim 16 has been withdrawn in this amendment.

AS TO THE DOUBLE PATENTING

The Examiner has made a provisional obviousness-type double patenting rejection of claims 1-2 and 6-12 as being unpatentable over claims 1-12 of copending Application No. 10/618,556. Once one of these two applications are allowed, a terminal disclaimer will be filed to overcome the double patenting rejection.

AS TO THE CLAIM OBJECTIONS

Claims 3, 7, 8, 12 and 13 were objected to because of informalities. Amendments were made to claims 3, 7, 12 and 13 as suggested by the Examiner. Claim 8 was amended to distinguish it from claims 2 and 7.

Applicants believe the claims objections on informalities have been solved by the amendments made to the claims.

AS TO THE 112 REJECTIONS

Claims 1-12 and 14-15 were rejected under 35 U.S.C. §112, second paragraph. The claims have been amended as suggested by the Examiner, except for the term "nominal diameter" in claims 6 and 7. The term "nominal diameter" is now in amended claim 10.

The nominal diameter is very close to the inside diameter of a pipe. The specifications for a particular type of pipe are set by standards such as ASTM. For example, see Applicants disclosure on Dimensional Conformance on page 19, line 34 to page 20, line 21 of the

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specification. The outside diameter of a plastic pipe needs to stay the same, so fittings can be applied. The inside diameter can vary slightly as a result of normal manufacturing variances. The term "nominal diameter" is used in the field of plumbing and is well understood by those in the art to be very close to the inside diameter.

The 35 U.S.C. §112 rejection is believed to have been overcome by the amendments to the claims and the explanation of "nominal diameter" above. The Examiner is respectfully requested to remove this rejection.

AS TO THE 102 REJECTION

Claims 1, 3, 6 and 13 were rejected under 35 U.S.C. §102(b) as being anticipated by Arakawa et al. (USPN 5,308,695). This rejection is respectfully traversed by the amendments made to claim 1. Claim 1, as amended, recites a "pipe". The product of Arakawa is an adhesive tape and is very different from a pipe which can transport water. The Figure 8 of Arakawa is merely the adhesive tape curled into circular shape for testing compressive strength. It is not a closed circle to form a pipe cross section as is in the present invention. Also, the product of Arakawa has a layer of adhesive on the outside surface of the tape (Fig. 1, No. 3). Applicants' invention does not have an adhesive on the outside surface. When Applicants use an adhesive, it is buried inside the pipe to aid in the adherence of the different polymer layers. The 35 U.S.C. §102(b) rejection has been traversed by the amended claims and the Examiner is requested to reconsider the rejection.

AS TO THE 103 REJECTION

Claims 1 and 3-6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cinadr et al. (USPN 6,124,406) in view of Gebizlioglu (USPN 6,287,657). This rejection is respectfully traversed.

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The reference Cinadr et al. teaches a process for making blocky chlorinated polyethylene (b-CPE) and its use as a compatibilizing agent for impact modification in PVC or CPVC. The materials made by Cinadr are one of the materials used by Applicants as their inner core of the pipe. Cinadr does not teach making multi-layer pipes. The only mention of pipe in the Cinadr reference is at col. 3, line 11, where Cinadr is referring to the use of the blocky chlorinated polyethylene as an additive to PVC or CPVC and that the PVC or CPVC with the additive can be made into pipe. No mention is made of making a single layer pipe with the blocky chlorinated polyethylene, much less a multi-layer pipe.

The Gebizlioglu reference teaches making a multi-layer pipe which is resistant to water or water vapor permeating from the outside of the pipe to the dry air flowing inside the pipe. The outer layer of Gebizlioglu's pipe is low density polyethylene while the inner layer is PVDC (Saran[®]) or FEP (fluorinated ethylene propylene copolymer). Neither PVDC nor FEP are part of Applicants' claims for the inner tubular core.

Gebizlioglu discloses at col. 3, lines 27-28, that polyethylene is a natural porous material and as such would be unacceptable as an inner layer of his pipe. This is verified by the table in Fig. 1 of Gebizlioglu where the permeability of low density polyethylene, high density polyethylene, and polypropylene are much greater than the materials specified by Gebizlioglu (PVDC and FEP).

A combination of the teachings of Cinadr and Gebizlioglu would not suggest to one skilled in the art to use a blocky chlorinated polyethylene as the inner layer and a polyethylene as the outer layer. Gebizlioglu would teach that a blocky chlorinated polyethylene would not be good for an inner layer. The combined teachings of Cinadr and Gebizlioglu might suggest to one skilled in the art that the blocky chlorinated polyethylene of Cinadr might be used as an additive in one of Gebizlioglu's layers to increase impact resistance.

It is submitted that the combined references do not teach a multi-layer pipe as is recited in the present claims. The Examiner is respectfully requested to reconsider this rejection.

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Claims 2 and 7-13 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cinadr et al. in view of Gebizlioglu and further in view of Doi et al. (USPN 4,351,876). This rejection is respectfully traversed as to the amended claims.

The references Cinadr and Gebizlioglu were discussed above. The reference Doi teaches making a laminate film or sheet which can be used as a food packaging container. Doi makes a copolymer of ethylene and an unsaturated silane compound. This copolymer is crosslinkable when exposed to moisture. Doi mixes this copolymer with a thermoplastic resin to make one layer of his film or sheet (see col. 3, lines 12-19). Doi does not teach at what level of the mixture the copolymer is used in the thermoplastic resin. Doi's process of making a copolymer which is crosslinkable is not the normal crosslinked polyethylene referred to in Applicants' invention. Doi compares a typical crosslinked polyethylene to his invention as shown in col. 5, line 60 to col. 6, line 40. Doi's table in column 6 shows the typical crosslinked polyethylene does not have good properties (see Comparative Ex. 1). Also, Doi states at col. 6, lines 4-7, that the typical crosslinked polyethylene gave a product that was not stable in the process and emitted a very strong odor, thus making it undesirable for the film of Doi.

The reference Doi does not teach using a chlorinated polyethylene as one of his layers. Doi does teach using PVC as one of his layers (col. 4, line 34). PVC is not chlorinated polyethylene. PVC is polyvinyl chloride and is a completely different class of thermoplastic from chlorinated polyethylene. PVDC is polyvinylidene chloride and is also a very different plastic from chlorinated polyethylene. PVDC is also sometimes referred to as Saran[®], since it was commercialized by Dow Chemical.

From the combined teachings of Cinadr, Gebizlioglu, and Doi one skilled in the art of making pipes and wanting to make them resistant to chlorine in potable water, would not be led to make the invention of Applicants' amended claims. The reference Doi is directed to a completely different product with different requirements than the pipe of the present invention. Doi does not mention chlorinated polyethylene as one of his layers, but even if he did, it would

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be a different art area. One skilled in the art of making pipes to transport water would not be likely to consult a teaching dealing with food pouches.

Cinadr does not teach a multi-layer pipe, only a single layer PVC or CPVC pipe as mentioned. Gebizlioglu teaches a multi-layer pipe, but teaches that polyethylene is bad in his pipe, and that one must use a high barrier material like PVDC or FEP. Doi does not teach a multi-layer pipe and does not teach that chlorinated polyethylene can be used.

It is submitted that the combined references do not render the amended claims obvious. The Examiner is requested to reconsider this rejection.

Claims 14 and 15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cinadr et al. in view of Gebizlioglu and Doi et al., and further in view of Bushi et al. (USPN 6,293,311). This rejection is respectfully traversed. The references Cinadr, Gebizlioglu and Doi were discussed above.

The reference Bushi teaches a composite pipe having a metal layer between two thermoplastic layers. An adhesive is applied to both sides of the metal layer to gain adhesion to the thermoplastic layer. Bushi requires that the outer layer be an amorphous thermoplastic. Examples of amorphous polymers are shown at col. 5, lines 26-35, and include materials such as PVC or CPVC. Amorphous polymers are required for the outer layer of Bushi's pipe because the pipe is designed to be solvent welded with fittings. Crystalline polymers, such as polyethylene and polypropylene cannot be solvent cemented with fittings. Polyethylene is not an amorphous polymer and therefore could not be used as the outer layer in Bushi's pipe.

Bushi's teaching added to the other references discussed above would lead one skilled in the art away from using a polyethylene or polypropylene outer layer.

Cinadr does not teach a multi-layer pipe, only a single layer PVC or CPVC which can contain a minor amount of blocky chlorinated polyethylene. Gebizlioglu teaches a multi-layer pipe, but teaches that polyethylene is not a good choice for the inner layer. Doi teaches making a multi-layer food pouch and does not mention chlorinated polyethylene as a possible layer. Bushi

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teaches a pipe having a middle layer of metal and that the outer layer must be an amorphous polymer, and not a crystalline polymer like polyethylene.

Applicants must stress that PVC and PVDC are not chlorinated polyethylene. They are completely different class of polymers.

The combined teachings of the references would not lead one skilled in the art of making pipes that carry water to the invention of Applicants as recited in the amended claims.

Several of the dependent claims of the present application are not patentable if they were independent stand alone claims, but they depend from other claims which recite patentable features. The dependent claims when read with the claims from which they depend are patentable subject matter.

SUMMARY

Applicants submit that the amended claims are unobvious in view of the references cited, when the references are considered alone or in combination. The references do not teach the present invention and in fact point away from the invention.

Applicants believe the rejections have been traversed as to the amended claims and the Examiner is requested to reconsider and allow the amended claims.

Respectfully submitted,

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